

# OVERVIEW OF COMMODITY REQUIREMENTS

## General Groups

### I. Vegetables

#### A. Leafy, floral and stem vegetables (High to very high perishability): *Artichoke, asparagus, broccoli, Brussels sprouts, cabbage, cauliflower, lettuces, and spinach. Can also include flowers in this group.*

**Quite perishable:** only cabbage and celery can be stored more than 2-4 weeks under ideal conditions.

**Water loss:** Most susceptible to water loss among all horticultural crops

**Decay:** not much pathogen problem unless free water is present on wounds and temperature is high.

⇒ **Ethylene:** is detrimental because of yellowing and acceleration of already high perishability.

**Cooled:** by vacuum, hydrocooling or slush ice.

**Store** at 0-1°C and 95% RH (except asparagus, 2-3°C).

#### B. Immature and mature fruit vegetables: (Moderate to high perishability).

##### 1. Immature fruit vegetables (highly perishable): *Beans, cucumber, eggplant, okra, pepper, summer squash and sweetcorn.*

**Quite perishable:** all (except sweetcorn and peas) are chilling sensitive and can be stored only 1 to a few weeks under ideal conditions.

**Water loss:** very susceptible to water loss (especially with chilling injury).

**Decay:** very susceptible to decay (especially with chilling injury).

**Ethylene:** is detrimental because of yellowing and acceleration of perishability.

**Cooled:** by hydrocooling and forced-air mostly.

**Store** at 5-12°C and 95% RH (except sweet corn and peas, 0°C)

**2. Mature fruit vegetables (Moderate perishability): *Melons, ripe pepper, tomato, and winter squash***

**Moderately perishable:** all are susceptible to CI but can usually be stored for 1 month or more at threshold temperature.

**Water loss:** only moderately susceptible to water loss.

**Decay:** quite susceptible to decay when ripe or chilled.

**Ethylene:** is used to initiate ripening of climacteric crops.

**Cooled** by forced air and some hydrocooling.

**Store** at 8-14°C depending on commodity and ripeness stage, and 95% RH.

**C. Underground storage organs: (Low-to-very low perishability).**

**1. Temperate (low perishability): *beet, carrot, radish, and turnip.***

**2. Subtropical/Tropical (low perishability): *cassava, cocoyam, potato, sweetpotato, taro, and yam.***

**3. Bulbs (very low perishability): *garlic and onion.***

**Not too perishable** overall. Radishes have the least storage potential (about 1 month); most can be stored several to many months if decay is controlled.

**Water loss:** temperate-zone commodities are more susceptible to water loss than others, which have lower water loss when cured.

**Decay:** Subtropical/tropical types are more prone to decay if not cured or if chilled. Bulbs are very susceptible to decay if not dried and kept dry.

⇒ **Chilling injury** is a major cause of losses for subtropical/tropical types in international trade.

**Ethylene:** is detrimental in that it promotes sprouting and decay.

**Cooling:** Temperate-zone types are cooled by hydrocooling, others by room cooling.

**Curing** is done by storing for ~1 week at ~30°C and 90% RH; drying is at 35-45°C and 60-75% RH.

Temperate: store at 0°C and 90-95% RH

Tropical/subtropical: store at 4-15°C and 85-90% RH

Bulbs: store at 0°C and 60-70%RH

## II. Fruits:

### A. Small fruits (High-to-very high perishability [with one exception - grapes]): *Blackberry, blueberry, grape, raspberry and strawberry.*

**Highly perishable:** Harvested ripe and very perishable due to fragility and susceptible to decay (1-2 weeks for most; grapes can be stored for many months if decay is controlled).

**Water loss:** moderately susceptible, but highest among the fruits.

**Ethylene:** is not a significant problem because they are nonclimacteric and/or already ripe when harvested.

**Cooled** by forced air.

**Store** at 0°C and 95% RH.

### B. Pome and stone fruits (Moderate-to-low perishability):

1. **Pome:** *Apple, pear and quince.*

2. **Stone:** *Apricot, cherry, nectarine, peach and plum.*

**Moderate to low perishability:** pome fruits are less perishable than stone fruits; storage usually limited by over ripeness; 1-2 months for stone fruits; 6-12 months for pome fruits.

**Water loss:** is generally low

**Decay:** Susceptible to decay, especially when wounded or ripe; a few varieties are chilling sensitive.

**Ethylene:** All are climacteric except cherries, so they are typically harvested unripe (at preclimacteric stage). Ethylene exposure is usually avoided to prolong storage.

**Cooling:** Pome fruits: room cooled; stone fruits: forced air cooling.

**Store** at 0-4°C and 90-95% RH.

**C. Subtropical and tropical fruits (Moderate-to-high perishability):**

- 1. Climacteric:** *Avocado, banana, kiwifruit, mango, and papaya.*
- 2. Nonclimacteric:** *Citrus fruits, loquat, pineapple and pomegranate.*

**Perishability** of fruits in this group is due primarily to decay and chilling injury. Potential storage life under optimal conditions ranges from 1 week (ripe banana, pineapple) to 3 months (some citrus).

**Water loss:** not usually a problem.

**Ethylene:** used to ripen bananas, avocado, mango; also to degreen citrus.

**Cooling:** Forced air or hydrocooling.

**Storage:** Storage temperatures for subtropicals is highly variable: 0°C for kiwifruit and oranges from some growing areas, to 13°C for some more chilling sensitive avocado cultivars. RH should always be 90-95%.

Tropicals are stored at 12-15°C and 90-95% RH.